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Edward Charles Pickering

PUBLICATIONS
OF THE
Astronomical Society of the Pacific.

Vol. XXXI. San Francisco, California, April, 1919 No. 180

## EDWARD CHARLES PICKERING, 1846-1919

It is the way of the world; perhaps not an unwise provision of Nature, in the long run of the human family, but certainly in general the source of our deepest regrets and sorrows.

The passing of Professor Pickering on February 3rd, in the seventy-third year of his life, has brought grief to an uncommonly wide circle of friends, for his merits included rare personal charm as well as great scientific ability and activity. That he was the most unselfish of men was discovered by all who discussed with him, in person or thru correspondence, the problems of their professions. Harvard College Observatory, under Pickering's directorship of fully forty-two years, was famous for its large-scale development and pursuit of astronomical research in new fields, and almost equally famous for the spirit of helpfulness to other observatories and to astronomers in many lands.

Professor Pickering's life was singularly active and efficient. He obtained an early start in his career, and he died in the harness. At twenty-one years of age he became professor of physics in the Massachusetts Institute of Technology, and but a day or two before his death he called several assistants to his bedside to discuss with him many ideas concerning Harvard Observatory work ahead. While in the Institute he established the first physical laboratory in America, and wrote an excellent and extensive textbook on the Elements of Physical Manipulation, as a laboratory guide. On February 1, 1877, in his thirty-first year, he became director of Harvard College Observatory. His administration was remarkable from beginning to end for originality and energy. His training in physics inclined him to apply the principles and instruments of the physical laboratory as auxiliaries to the telescope in the study of the stars. He made provision for continuing and extending the work of the Harvard meridian circle in determining the accurate positions of the stars in accordance with the plans of the Astronomische Gesellschaft, but the immediate responsibility for the meridian work was with Professor Rogers and Professor Searle, successively. Pickering's own labors and the further expansion of the Observatory's work during the forty-two years related almost exclusively to researches on the brightness of the stars and the spectra of the stars. This radical departure from conventional observatory policy caused him to be criticised severely by many astronomers older than himself, but not many of his critics were his juniors in years, as the rapid passing of time fully justified his methods and purposes. His vision as to the immense richness of fields of investigation first entered, on small scales, by Secchi, Rutherfurd, Huggins, Vogel, and Henry Draper, his courage and his scientific and executive abilities, have given wonderful assistance in developing that side of astronomy known as Astrophysics.

Professor Pickering was one of the first to realize, in 1883, some of the possibilities of photography in astronomical research, and from that date the new instruments and the new methods of Harvard College Observatory have been mainly photographic. He was the first to show that photographs obtained with small telescopes and suitable equipment of prisms will record delicate features of stellar spectra far beyond what the eye can detect, even with the assistance of the most powerful telescopes in existence. The application of the photographic method to the study of stellar spectra at Harvard College Observatory was stimulated and efficiently supported on the financial basis of the Henry Draper Memorial, established in 1885 by Mrs. Draper in honor of her distinguished husband, who had been the first to succeed in photographing a stellar spectrum which showed the spectrum lines.

Professor Pickering realized the need for extending his programs of observation to stars distributed over the entire sky. Fortunately, and by virtue of Director Pickering's success, there came to Harvard College Observatory the Boyden Fund of $230,000 for astronomical investigations to be made at high altitudes above sea level. This fund was used to establish and maintain the Arequipa Observatory in Peru.

The systematic photography of stellar spectra at Cambridge and Arequipa has led to results of priceless value, of which we mention only two:[1]

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[1] A more detailed account of Professor Pickering's activities and successes than is here attempted has already been published by the Astronomical Society of the Pacific on the occasion of awarding the Bruce Gold Medal to Professor Pickering in the year 1908. See *Publ. A. S. P.*, **20**, 55, 1908.

1. The Harvard catalogs of stellar spectra, thus far published, contain descriptions of the spectra of more than 26,000 of the brighter stars. *The* (new) *Henry Draper Catalogue* of stellar spectra, now in manuscript, and going thru the press, will describe the spectra of about 222,000 stars distributed over the entire sky. The finished catalog will consist of nine thick quarto volumes. Unfortunately Professor Pickering lived to see only two of the nine volumes thru the press. It is impossible to overestimate the value of this catalog and its Harvard predecessors to all students of the stars, whether they are interested in determining what the stars are, what their history has been and will be, where the stars are, or whither they are going. It should be said that we are indebted to Miss Annie J. Cannon, of Harvard Observatory, for the faithful, able and extensive work of examining critically the photographs upon which this catalog is based, and for the resulting descriptions of the individual spectra. It is interesting to note that Professor Pickering made the very expensive publication of *The Henry Draper Catalogue* a charge against his personal fortune. It is believed that he frequently gave of his own resources to further the astronomical plans, not only of Harvard Observatory, but of other institutions and of individuals.

2. A profound study of the spectra of the naked eye stars by Professor Pickering and some of his chief assistants, notably Miss Maury, Mrs. Fleming, and Miss Cannon, led to the formulation of the Harvard system of stellar classification. The high esteem in which this system is held may be inferred from the fact that the international committee of astronomers within the Solar Union unanimously recommended its adoption in current astronomical research.

The brightness of nearly 50,000 stars has been measured at Cambridge and Arequipa, in major part by Professor Pickering personally with photometers of his devising. His own measures of the brightness of the northern stars number more than one and a half millions. The results of all these observations form an invaluable system of stellar magnitudes that is in almost universal use.

The Harvard discoveries of variable stars number 3,435 to date. This is more than two-thirds of all the known variables. These were discovered in nearly all cases by photographic methods.

A unique program of observation at the Harvard Observatory consists in the rapid photography of the night sky, by methods largely automatic, using a camera of only one inch aperture. This camera is able to cover the entire area of the northern night sky in two successive nights. The photographs secured in this manner are cataloged and filed for future reference. This collection of photographs may fairly be described as the Harvard written history of the night sky. The value of this collection of photographs has been demonstrated on many occasions. When the extraordinarily brilliant new star in *Aquila* was discovered on June 8, 1918, astronomers desired to know the earlier history of this star. Three decades of this history were written in the Harvard photographic files. A reference to this history disclosed that the new star had existed as a variable star of approximately the tenth magnitude during these decades, and that its rise from the tenth magnitude to approximate equality with *Sirius* on June 9th had taken place in a few days preceding the date of discovery. Other applications of the Harvard history to especially interesting astronomical problems are equally noteworthy.

Professor Pickering was greatly beloved at home and by astronomers everywhere, and his innate kindness and consideration had much to do with his success. Recognition and honors came to him in great numbers and from high places. Six American universities and two European universities conferred doctor's degrees upon him, and he was a Knight of the Order Pour le Mérite. He was an honorary member of the leading national societies of Great Britain, France, Germany, Ireland, Italy, Mexico, Russia, and Sweden, and of many of the more special societies. He was awarded the Henry Draper Gold Medal of the National Academy of Sciences, the Rumford Gold Medal of the American Academy of Arts and Sciences, the Bruce Gold Medal of the Astronomical Society of the Pacific, and he had the distinction of receiving the Gold Medal of the Royal Astronomical Society on two occasions. It is probable that the expression of confidence which gave him greatest satisfaction, and certainly the highest expression of the esteem in which he was held by his American colleagues, consisted in his annual re-election as President of the American Astronomical Society from 1905 to the time of his death.

W. W. Campbell.